

What is claimed is:

1. A method of etching a substrate, comprising steps of:
providing a substrate having oxide over silicon nitride;
providing a fluorinated plasma comprising an additive fluorocarbon having at least as many hydrogen atoms as fluorine; and
exposing said substrate to said fluorinated plasma to etch through at least a portion of said oxide to expose a region of said silicon nitride.
2. A method according to claim 1, further comprising a step of providing said substrate a temperature of at least 30° C.
3. A method according to claim 1, wherein said additive fluorocarbon comprises at least one of CH_2F_2 and CH_3F .
4. A method according to claim 3, wherein said fluorinated plasma further comprises at least one of CHF_3 and CF_4 .
5. A method according to claim 4, wherein said fluorinated plasma further comprises argon.
6. A method of etching a layered semiconductor substrate, comprising steps of:
providing nitride over at least a portion of a semiconductor substrate;
forming second different material over at least a portion of said nitride; and
etching through at least a portion of said second material to expose at least a portion of said nitride;
said etching using a plasma comprising an additive fluorocarbon compound having at least as many hydrogen atoms as fluorine.
7. A method according to claim 6, wherein said additive fluorocarbon compound comprises at least one of CH_2F_2 and CH_3F .
8. A method according to claim 7, wherein said plasma further comprises at least one of CF_4 and CHF_3 .
9. A method according to claim 8, wherein said plasma further comprises argon.

10. A method according to claim 7, wherein said additive fluorocarbon compound is provided a gas flow of at least 3% of the total flow for said plasma.
11. A method according to claim 10, wherein said additive fluorocarbon compound is provided a gas flow of 3-20% of the total flow for said plasma.
12. A method according to claim 11, wherein the total flow for said plasma comprises 70-90% of at least one of CHF₃, CF₄ and AR.
13. A method according to claim 12, wherein said total flow comprises at least 3% CHF₃.
14. A method according to claim 13, wherein said total flow comprises at least 10% CF₄.
15. A method according to claim 14, wherein said total flow comprises at least 33% argon.
16. A method according to claim 6, wherein said second material comprises oxide.
17. A method according to claim 16, wherein said oxide comprises at least one of undoped silicon oxide and doped silicon oxide.
18. A method according to claim 6, further comprising a step of maintaining said substrate at a temperature above 30° C.
19. A method of plasma processing a layered structure, said method comprising the steps of:
providing a layered structure comprising silicon nitride and silicon oxide over at least a portion thereof;
generating a plasma from gases comprising first fluorocarbons having at least as many hydrogen atoms as fluorine; and
employing said plasma to etch through at least a portion of said silicon oxide and expose a portion of said silicon nitride.
20. A method according to claim 19, wherein said first fluorocarbons comprise at least one of CH₂F₂ and CH₃F.
21. A method according to claim 20, wherein said gases further comprise second fluorocarbons comprising at least one of CHF₃ and CF₄.
22. A method according to claim 21, wherein said gases further comprise argon.

